May 25, 1926. 1,586,351

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FITTING FOR THERMOMETERS

Filed March 15, 1924

Fig. 1.

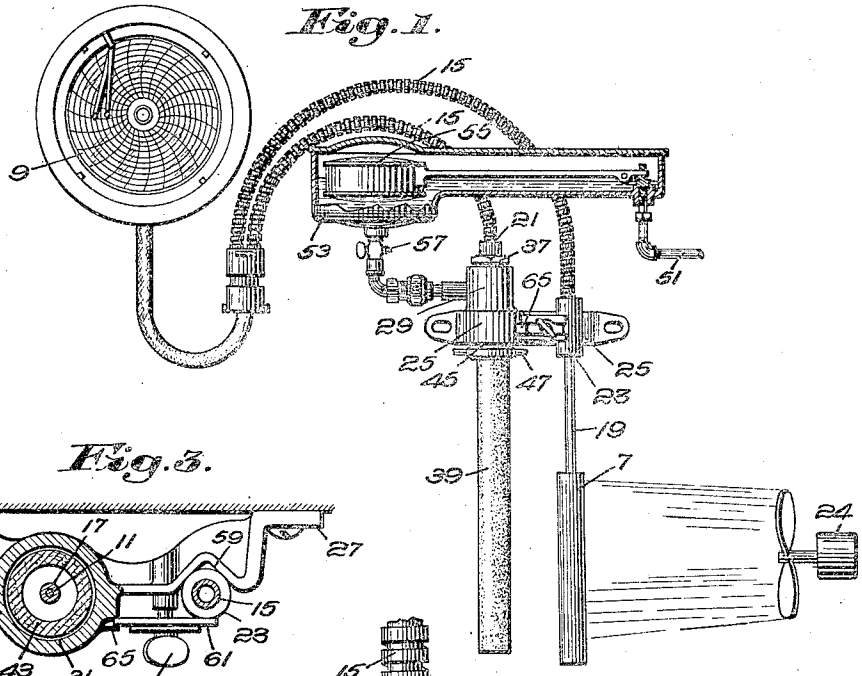
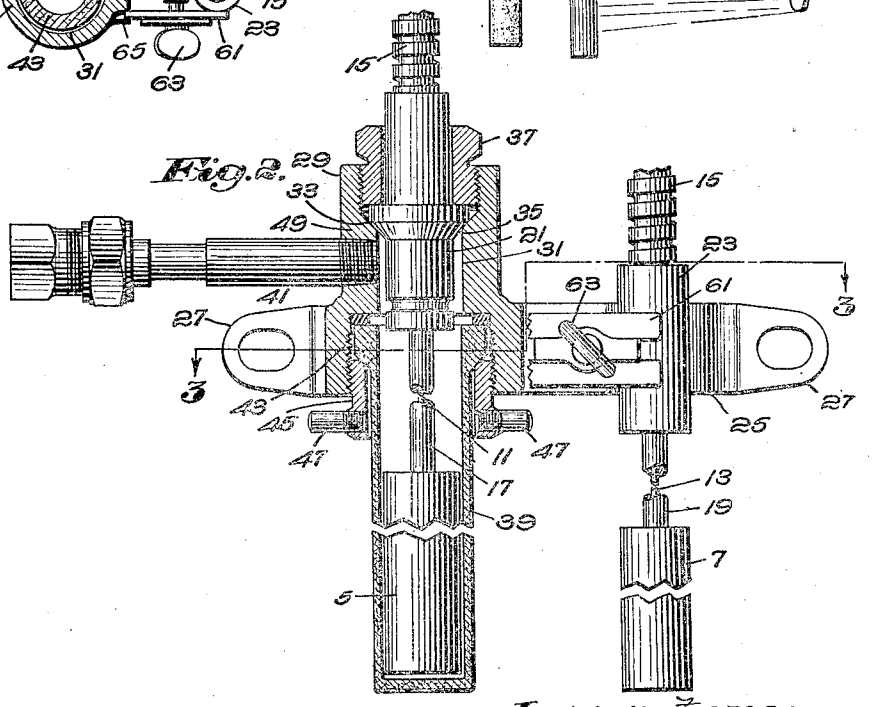


Fig. 3.

Fig. 2.



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Patented May 25, 1926. 1,586,351

UNITED STATES PATENT OFFICE.

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FITTING FOR THERMOMETERS.

Application filed March 15, 1924. Serial No. 699,601.

This invention relates to thermometers and has particularly to do with a means for mounting or supporting the bulb or reservoir for the expansible fluid. It finds a particular application in the case of wet bulb thermometers and for that reason we have herein shown as an illustrative example of our invention a construction applied to a so-called psychrometer or wet and dry bulb thermometer such as is used for measuring the humidity of the atmosphere.

Our invention will be well understood by the following description of the particular form chosen for purposes of illustration and shown in the accompanying drawings, wherein:

Fig. 1 is a partly diagrammatic view in elevation of a psychrometer installation;

Fig. 2 is an enlarged elevation partly in section and partly broken away of the bulbs and their support; and

Fig. 3 is a section on the line 3—3 of Fig. 2, but on a smaller scale.

As an example of our invention we have herein shown (see Figs. 1 and 2) a recording psychrometer or hygrometer having a wet bulb 5 and a dry bulb 7 connected to suitable pressure responsive devices of a recording instrument 9 of the recording pressure gage type by means (see Fig. 2) of capillary pipes 11 and 13 respectively, which pipes are enclosed in and protected by the flexible armor tubing 15. The bulbs proper 5 and 7 may be supported by short sections of rigid tubing 17 and 19 from elements 21 and 23 providing engaging means for suitable supports or clamps for holding the bulbs in position and these elements we shall herein refer to as portions of the bulb casings since each forms a part of the support or frame-work for its respective bulb by which it is handled, positioned and immediately supported.

Our invention more particularly relates to the means for supporting the bulbs and their casings in the place the humidity conditions of which it is desired to measure. The bulbs are preferably supported, as indicated in Fig. 1 by the diagrammatic showing of an electric fan 24, in such a manner that any current of air will pass first over the dry bulb 7 so that any moisture evaporated from the wet bulb will not affect the dry bulb reading. In the example shown the bulbs are in the vertical position but this is not essential.

In accordance with our invention we provide a suitable support which may consist (see Fig. 2) of a bracket 25 having feet 27 by means of which it may be secured to a suitable supporting surface to hold the bulb suspended from but suitably spaced away from such surface. To support the wet bulb the bracket may be provided with an enlargement 29 having a cylindrical opening 31 of such size as to pass the bulb 5 so that the latter may be inserted from one end of the opening and pass through to the other side of the bracket as will be clearly understood from Fig. 2. At one end of the opening there is provided a seat 33, conveniently tapered, on which is adapted to seat an enlargement or shoulder 35 on the bulb casing 21 and a nut or gland 37 may be provided cooperating with the enlargement on the bulb casing and serving to press this shoulder against the seat, thus rigidly supporting the bulb 5 in position. The wet bulb is provided for a purpose later to be explained with a suitable casing 39 of porous earthenware or similar material enclosing the sides and bottom of the bulb and to secure this casing in position the opening 31 is provided with a seat 41 at the end opposite from the seat 33 against which may seat the end of the casing 39 which may be provided with an enlargement 43 cooperating with a clamping nut or gland 45 conveniently provided with wings or handles 47 to facilitate its operation. Such handles are particularly desirable on the gland for clamping the earthenware casing 39 as they will avoid the use of a wrench which might lead to breakage of the relatively fragile casing.

It will be clear that if the bulb is in position the casing 39 may be applied endwise over the same and secured in position by the gland 45 and likewise this casing may be removed for replacement, repair or cleaning without disturbing the bulb 5. Also by unscrewing the gland 37 the bulb may be withdrawn endwise, upwardly in Fig. 2, and removed from the support 25 without removing or disturbing the casing 39.

In the operation of the wet bulb thermometer shown the porous casing 39 surrounding the wet bulb 5 is kept filled with water. This water seeps through the interstices of

the casing and is evaporated from the outside thereof with a speed and cooling effect dependent upon the humidity of the surrounding air. This arrangement has marked advantages over the customary wick or textile jacket applied around the wet bulb and dipping into a receptacle of water. To keep the casing supplied with water the enlargement 25 is provided with a water intake port 49 leading to the opening 31 at a point between the seats 33 and 41 and through this opening water may be supplied to the interior of the casing 39 in any convenient manner. In the form of the invention shown the fitting is connected to a supply of water under pressure, such as the ordinary city water supply, entering (see Fig. 1) through pipe 51. To maintain a constant head of water in the jacket 39 to provide for uniform operation of the instrument a suitable water containing reservoir 53 is piped up to the opening 49 and a constant level of water is maintained in the reservoir by means of a valve controlling the main supply through the pipe 51, which valve is governed by a float 55 controlled by the level of water in the reservoir. A cock 57 may be provided, if desired, for shutting off the reservoir 43 from the space above the bulb.

When a dry bulb is used in connection with the wet bulb it may be supported adjacent the wet bulb on the same bracket 25 and for this purpose an open-sided seat or groove 59 may be provided in the bracket 25 paralleling the bore 31 of enlargement 29. The dry bulb may be placed in position by a lateral movement of approach as distinguished from an endwise movement of threading the bulb through an opening and the fitting 23 brought to rest in the seat 59 which will support the bulb 7 adjacent the bulb 5 in its casing 39 as shown in Figs. 1 and 2. Suitable clamping means serve to hold the bulb casing 23 in the seat 59 and we have herein shown a strap 61 having one end resting on the enlargement 25 and adapted to extend over the fitting 23. A thumb screw 63 extends through the strap 61 and taps into the base of the bracket 25 and serves to clamp the bulb casing 23 in the seat 59 and to the bracket. As best seen from Figs. 1 and 3, the ends of strap 61 may be forked so that it may fit a lug 65 on the enlargement 25 and be prevented from turning when screw 63 is set up.

We have described in detail the particular physical construction adapted for use with a psychrometer illustrated in the accompanying drawings, but this detailed description has had the purpose of making that particular construction clear and is not to be understood as a limitation of the scope of the invention. The inventive idea exemplified by the particular device disclosed might be embodied in various constructions and forms and what we claim as new and desire to secure by Letters Patent we shall express in the following claims.

Claims.

1. In a wet bulb thermometer a thermometer having a bulb, a supporting base having an opening to pass the thermometer bulb, means at one end of the opening to clamp a portion of the thermometer to secure the bulb to the fitting, a porous cup to enclose the bulb and means at the other end of the opening for independently clamping the porous cup about the bulb.

2. In a wet bulb thermometer a base having a cylindrically apertured enlargement, the aperture being of a size to pass the thermometer bulb, there being a seat adjacent one end of the aperture, a thermometer having a bulb and a shoulder near the bulb to cooperate with the seat, a fitting to press the shoulder to the seat, a seat at the opposite end of the aperture, a porous cup having an open end presented to the seat, a fitting to press the cup against the seat and a water inlet opening to the aperture between said seats.

3. In a wet bulb thermometer a thermometer having a bulb, a porous cup to surround the sides and ends of the bulb and a supporting base having separate means for securing thereto the thermometer bulb and the cup and permitting on manipulation of one such means the withdrawal of the bulb from within the cup without disturbing the cup and on manipulation of the other the removal of the cup from about the bulb without disturbing the bulb.

4. In a wet bulb thermometer a thermometer having a bulb, a porous cup to surround the sides and ends of the bulb, and a supporting base having separate means for securing thereto the thermometer bulb and the cup permitting on manipulation of one of such means the withdrawal of the bulb from within the cup without disturbing the cup or on manipulation of the other the removal of the cup from about the bulb without disturbing the bulb, said base having a water inlet therein independent of said securing means and providing communication to the open top of said cup.

5. A psychrometer comprising a dry bulb casing, a wet bulb casing, a ceramic cover to receive the wet bulb and a fitting comprising a base having an apertured enlargement provided with seats adjacent the ends thereof, means to secure respectively to said seats the wet bulb casing and the ceramic cover for the wet bulb and a clamp adapted to engage laterally with the dry bulb casing to clamp it against the base adjacent the enlargement.

6. A psychrometer comprising a dry bulb casing, a wet bulb casing, a ceramic cover

to receive the wet bulb and a fitting comprising a base having an apertured enlargement, provided with seats adjacent the ends thereof, means to secure respectively to said seats the wet bulb casing and the ceramic cover for the wet bulb, there being a seat in said base paralleling said enlargement and adapted to receive the dry bulb casing by a lateral movement of the latter, a clamp overlying the seat and means to press it toward the base.

7. A psychrometer comprising a dry bulb casing, a wet bulb casing, a ceramic cover to receive the wet bulb and a fitting comprising a base having an apertured enlargement, provided with seats adjacent the ends thereof, means to secure respectively to said seats the wet bulb casing and the ceramic cover for the wet bulb, there being a seat in said base paralleling said enlargement and adapted to receive the dry bulb casing by a lateral movement of the latter, a strap having an end supported on the enlargement and extending over said seat and a clamping screw connecting said strap and the base.

8. A thermometer having a bulb, a bulb casing having a shoulder, a fitting comprising a sleeve having an opening through which the bulb may be passed, a nut on said casing threaded to said fitting at one end of the opening and cooperating with said shoulder to clamp the casing in fixed position in said fitting, a seat at the other end of the opening, a porous ceramic cup seating on said sleeve and surrounding the sides and ends of the bulb and a threaded fitting to clamp the cup against the seat.

9. A thermometer fitting comprising a sleeve having an opening through which the bulb may be passed, a seat adjacent one end of the sleeve to receive a portion of the bulb casing, a nut on said sleeve to cooperate with said portion of the casing, a seat at the other end of said sleeve, a cover to enclose the bulb fitting the seat and a second nut on said sleeve to clamp the cover to its seat.

In testimony whereof, we have signed our names to this specification.

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